EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Mathew Ellsworth, Reg. No. 56345 on September 15, 2009.

The application has been amended as follows:

IN THE CLAIMS:

1. (Currently Amended) A method for characterizing a quality of a network path, including a first segment and a second segment, the method comprising:

modeling, by at least one network device, negative linear exponential equations for deriving first and second metrics,

wherein modeling one of the negative linear exponential equations comprises determining a first parameter of the negative exponential equation corresponding to underestimating a quality characterization, determining a second parameter of the negative exponential equation corresponding to overestimating the corresponding quality characterization, and determining a third parameter from an average of the first

and second parameters;

wherein the first and second metrics are at least in part quality characterizations of a

same plurality of one or more network applications;

accessing the first metric and the second metric,

the quality characterization characterizes a quality of the same plurality of one or more network applications running at one or more segment end-points,

the first metric and the second metric are at least partly a function of a same plurality of one or more elementary network parameters,

the plurality of one or more network parameters include one or more of delay, jitter, loss, currently available bandwidth, and intrinsic bandwidth,

the first metric is at least partly the function of the same plurality of network parameters of the first segment,

the one or more segment end points include one or more endpoints of the first segment,

the second metric is at least partly the function of the same plurality of network parameters of the second segment, and

the one or more segment end points include one or more endpoints of the second segment; and

adding the first metric and the second metric to generate a third metric,

wherein the third metric is at least partly the function of the same plurality of one or more network parameters of the network path,

the one or more segment end points include one or more endpoints of the network path, and

the third metric is a quality characterization of the same plurality of one or more applications.

2. (Previously Presented) The method of claim 1, further comprising:

prior to accessing the first or the second metric, generating at least one of the first metric and the second metric.

3. (Previously Presented) The method of claim 1, further comprising:

prior to accessing the first or the second metric, receiving at least one of the first metric and the second metric.

4. (Original) The method of claim 1, wherein at least one of the plurality of one or more network parameters is dynamic.

5. (Original) The method of claim 1, wherein at least one of the plurality of one or more network parameters is static.

6. (Original) The method of claim 1, wherein the plurality of one or more network applications include at least one of UDP and TCP applications.

7. (Original) The method of claim 6, wherein the plurality of one or

more network applications include UDP applications.

8. (Original) The method of claim 7, wherein the plurality of one or more network applications include voice.

9. (Original) The method of claim 7, wherein the plurality of one or more network applications include video.

10. (Original) The method of claim 9, wherein the plurality of one or more network applications include video conferencing.

11. (Original) The method of claim 6, wherein the plurality of one or more network applications include TCP applications.

12. (Original) The method of claim 11, wherein the plurality of one or more network applications include HTTP.

13. (Previously Presented) The method of claim 12, wherein the plurality of one or more network applications include one of HTTP/1 .0 and HTTP/1.1.

14. (Canceled).

15. (Original) The method of claim 11, wherein the plurality of one or

more network applications include ftp.

16. (Original) The method of claim 11, wherein the plurality of one or more network applications include telnet.

17. (Original) The method of claim 1, wherein the plurality of one or more network parameters include delay.

18. (Original) The method of claim 1, wherein the plurality of one or more network parameters include jitter.

19. (Original) The method of claim 1, wherein the plurality of one or more network parameters include loss.

20. (Original) The method of claim 1, wherein the plurality of one or more network parameters include currently available bandwidth.

21. (Original) The method of claim I, wherein the plurality of one or more network parameters include intrinsic bandwidth.

22. (Previously Presented) The method of claim 1, wherein the first, second, and third metrics include non-performance related characteristics.

23. (Previously Presented) The method of claim 22 , wherein the non-

performance related characteristics includes pre-specified route preferences.

24. (Currently Amended) A network system, comprising:

a plurality of one or more network devices configured, such that if the network device is coupled to at least a network path including a first segment and a second segment, the plurality of one or more network devices performing:

modeling, by one or more of the plurality of one or more network device, negative linear exponential equations for deriving first and second metrics, wherein modeling one of the negative linear exponential equations comprises determining a first parameter of the negative exponential equation corresponding to underestimating a quality characterization, determining a second parameter of the negative exponential equation corresponding to overestimating the corresponding quality characterization, and determining a third parameter from an average of the first and second parameters;

wherein the first and second metrics are at least in part quality characterizations of a

same plurality of one or more network applications;

accessing the first metric and the second metric,

the quality characterization characterizes a quality of the same plurality of one or more network applications running at one or more segment end-points,

the first metric and the second metric are at least partly a function of a same plurality of one or more elementary network parameters,

the plurality of one or more network parameters include one or more of delay, jitter, loss, currently available bandwidth, and intrinsic bandwidth,

the first metric is at least partly the function of the same plurality of network parameters of the first segment,

the one or more segment end points include one or more endpoints of the first segment,

the second metric is at least partly the function ofthe same plurality of network parameters of the second segment, and

the one or more segment end points include one or more endpoints of the second segment; and

adding the first metric and the second metric to generate a third metric,

wherein the third metric is at least partly the function of the same plurality of one or more elementary network parameters of the network path,

the one or more segment end points include one or more endpoints of the network path, and

the third metric is a quality characterization of the same plurality of one or more applications.

25. (Previously Presented) The network system of claim 24, wherein the network device further performs:

prior to accessing the first or the second metric, generating at least one of the first metric and the second metric.

26. (Previously Presented) The network system of claim 24, wherein the network device further performs:

prior to accessing the first or the second metric, receiving at least one of the first metric and the second metric.

27. (Previously Presented) The network system of claim 24, wherein at least one of the plurality of one or more network parameters is dynamic.

28. (Previously Presented) The network system of claim 24, wherein at least one of the plurality of one or more network parameters is static.

29. (Previously Presented) The network system of claim 24, wherein the plurality of one or more network applications include at least one of UDP and TCP applications.

30. (Previously Presented) The network system of claim 29, wherein the plurality of one or more network applications include UDP applications.

31. (Previously Presented) The network system of claim 30, wherein the plurality of one or more network applications include voice.

32. (Previously Presented) The network system of claim 30, wherein the plurality of one or more network applications include video.

33. (Previously Presented) The network system of claim 32, wherein the plurality of one or more network applications include video conferencing.

34. (Previously Presented) The network system of claim 29, wherein the plurality of one or more network applications include TCP applications.

35. (Previously Presented) The network system of claim 34, wherein the plurality of one or more network applications include HTTP.

36. (Previously Presented) The network system of claim 35, wherein the plurality of one or more network applications include one of HTTP/1.0 and HTTP/1.1.

37. (Canceled).

38. (Previously Presented) The network system of claim 34, wherein the plurality of one or more network applications include ftp.

39. (Previously Presented) The network system of claim 34, wherein the plurality of one or more network applications include telnet.

40. (Previously Presented) The network system of claim 24, wherein the plurality of one or more network parameters include delay.

41. (Previously Presented) The network system of claim 24, wherein the

plurality of one or more network parameters include jitter.

42. (Previously Presented) The network system of claim 24, wherein the plurality of one or more network parameters include loss.

43. (Previously Presented) The network system of claim 24, wherein the plurality of one or more network parameters include currently available bandwidth.

44. (Previously Presented) The network system of claim 24, wherein the plurality of one or more network parameters include intrinsic bandwidth.

45. (Previously Presented) The network system of claim 24, wherein the first, second, and third metrics include non-performance related characteristics.

46. (Original) The network system of claim 45, wherein the non-performance related characteristics includes pre-specified route preferences.

47. (Previously Presented) The network system of claim 24, further comprising:

a plurality of one or more inputs adapted to be coupled to the network path; and

a plurality of one or more outputs coupled to the plurality of one or more inputs,

wherein responsive to a plurality of one or more packets arriving to the network device through the plurality of one or more inputs, the network device selects at least

one output from the plurality of one or more outputs, and

the at least one output is determined at least partly using at least one of the first metric, second metric, and third metric.

48. (Previously Presented) The method of claim 1, wherein the function of the same plurality of one or more network parameters is a combination of multiple component functions, wherein each of the multiple component functions is tailored to measure a performance characteristic of a corresponding one of the one or more network parameters.

49. (Previously Presented) The method of claim 1, wherein the first metric and the second metric are both derived from mean opinion scores.

50. (Previously Presented) The method of claim 1, wherein modeling negative linear exponential equations comprises fitting curves corresponding to the quality characterizations.

51. (Canceled).

52. (Canceled).

53. (Previously Presented) The method of claim 1, wherein a single negative linear exponential equation models both voice and TCP traffic, and further

wherein a parameter of the single negative linear exponential equation is derived from first and second parameters of negative linear exponential equations corresponding to voice and TCP traffic, respectively.

54. (Currently Amended) A method of characterizing a quality of a network path, including a first segment and a second segment, the method comprising:

using products of negative exponential functions for deriving first and second metrics, wherein deriving one of the negative linear exponential equations comprises determining, by a network device, a first parameter of the negative exponential equation corresponding to underestimating a quality characterization, determining, by the network device, a second parameter of the negative exponential equation corresponding to overestimating the corresponding quality characterization, and determining, by the network device, a third parameter from an average of the first and second parameters;

wherein the first and second metrics are at least in part quality characterizations of a

same plurality of one or more network applications;

accessing the first metric and the second metric,

the quality characterization characterizes a quality of the same plurality of one or more network applications running at one or more segment end-points,

the first metric and the second metric are at least partly a function of a same plurality of one or more elementary network parameters whose individual

performance is modeled using a negative exponential function,

the plurality of one or more network parameters include one or more of delay, jitter, loss, currently available bandwidth, and intrinsic bandwidth,

the first metric is at least partly the function of the same plurality of network parameters of the first segment,

the one or more segment end points include one or more endpoints of the first segment,

the second metric is at least partly the function of the same plurality of network parameters of the second segment, and

the one or more segment end points include one or more endpoints of the second segment; and

adding the first metric and the second metric to generate a third metric,

wherein the third metric is at least partly the function of the same plurality of one or more network parameters of the network path,

the one or more segment end points include one or more endpoints of the network path, and

the third metric is a quality characterization of the same plurality of one or more applications.

Allowable Subject Matter

Claims 1-13, 15-36, 38-50, 53-54 allowed.

The following is an examiner's statement of reasons for allowance:

The provision for a method for characterizing a quality of a network path, including a first segment and a second segment, the method comprising:

modeling, by at least one network device, negative linear exponential equations for deriving first and second metrics,

wherein modeling one of the negative linear exponential equations comprises determining a first parameter of the negative exponential equation corresponding to underestimating a quality characterization, determining a second parameter of the negative exponential equation corresponding to overestimating the corresponding quality characterization, and determining a third parameter from an average of the first and second parameters;

wherein the first and second metrics are at least in part quality characterizations of a same plurality of one or more network applications;

accessing the first metric and the second metric,

the quality characterization characterizes a quality of the same plurality of one or more network applications running at one or more segment end-points,

the first metric and the second metric are at least partly a function of a same plurality of one or more elementary network parameters,

the plurality of one or more network parameters include one or more

of delay, jitter, loss, currently available bandwidth, and intrinsic bandwidth,

the first metric is at least partly the function of the same plurality of network parameters of the first segment,

the one or more segment end points include one or more endpoints of the first segment,

the second metric is at least partly the function of the same plurality of network parameters of the second segment, and

the one or more segment end points include one or more endpoints of the second segment; and

adding the first metric and the second metric to generate a third metric,

wherein the third metric is at least partly the function of the same plurality of one or more network parameters of the network path,

the one or more segment end points include one or more endpoints of the network path, and

the third metric is a quality characterization of the same plurality of one or more applications

-- wherein all the features previously described are combined in one singular embodiment, is not fairly taught or suggested by the prior art of record.

The Examiner interprets the claimed methods as pertaining to statutory subject matter such as a process being performed by a machine. While the claimed network device is not explicitly described in the Applicant Specifications as hardware the

Examiner cannot determine any portion of the Applicant Specifications that would suggest that the network device is embodied entirely of software components or by an algorithm. Thus the meaning of the network device is interpreted according to what is well-known in the networking art, that is of a machine connected to a network.

The Examiner finds particular novelty in the methods for characterizing the quality of a network path as described in the Applicant Specification (Page 11 Lines 10-20) wherein modeling one of the negative linear exponential equations comprises determining a first parameter of the negative exponential equation corresponding to underestimating a quality characterization. Furthermore the method also comprises determining a second parameter of the negative exponential equation corresponding to overestimating the corresponding quality characterization (Page 12 Lines 10-20) . Furthermore the method also comprises determining a third parameter from an average of the first and second parameters (Page 12 Lines 20-25 , Page 46 Lines 20-30). Furthermore the negative linear equations include a first and second metrics such that the first metric and the second metric are at least partly a function of a same plurality of one or more elementary network parameters, the plurality of one or more network parameters including one or more of delay, jitter, loss, currently available bandwidth, and intrinsic bandwidth. (Page 5 Lines 20-30). Furthermore the method includes adding the first metric and the second metric to generate a third metric.(Page 8 Lines 20-30)

Juttner disclosed determining a path in a communications system that minimizes a cost function and satisfies an additional constraint, these constraints referred to as QoS requirements, thereby providing a solution to the QoS routing problem. Juttner disclosed wherein cumulative parameters can be either additive (e.g., delay, jitter and administrative weight) or multiplicative (e.g., loss probability).

However Juttner does not disclose wherein modeling one of the negative linear exponential equations comprises determining a first parameter of the negative exponential equation corresponding to underestimating a quality characterization. Furthermore Juttner does not disclose determining a second parameter of the negative exponential equation corresponding to overestimating the corresponding quality characterization . Furthermore Juttner does not disclose determining a third parameter from an average of the first and second parameters.

Hultgren disclosed dynamic optimization of quality assured connections between end nodes when quality service is requested by a node.

However Hultgren does not disclose wherein modeling one of the negative linear exponential equations comprises determining a first parameter of the negative exponential equation corresponding to underestimating a quality characterization. Furthermore Hultgren does not disclose determining a second parameter of the negative exponential equation corresponding to overestimating the corresponding

quality characterization . Furthermore Hultgren does not disclose determining a third parameter from an average of the first and second parameters.

Saleh disclosed a method for discovering preferable routes between two nodes in a network. Saleh successively determines the most desirable path to certain nodes in the network, re-calculating the path as nodes increasingly farther from the node calculating the path (the root node) are considered, filling the entries in a path table as the method proceeds. This process continues until an end condition is reached, such as when all nodes in the network are processed, the second of the two end nodes (the destination node) is reached, a maximum number of hops has been reached, or some other criteria is met.

However Saleh does not disclose wherein modeling one of the negative linear exponential equations comprises determining a first parameter of the negative exponential equation corresponding to underestimating a quality characterization. Furthermore Saleh does not disclose determining a second parameter of the negative exponential equation corresponding to overestimating the corresponding quality characterization . Furthermore Saleh does not disclose determining a third parameter from an average of the first and second parameters.

Hardy disclosed determining what combinations of packet loss rate and packet delay are tolerable where a packet switched telephony service is desired to be perceived to be substantially equivalent to a traditional toll-quality non-packet-switched

telephone service. Empirically derived models are used to relate user perception to objectively measurable characteristics, such as packet loss rate.

However Hardy does not disclose wherein modeling one of the negative linear exponential equations comprises determining a first parameter of the negative exponential equation corresponding to underestimating a quality characterization. Furthermore Hardy does not disclose determining a second parameter of the negative exponential equation corresponding to overestimating the corresponding quality characterization. Furthermore Hardy does not disclose determining a third parameter from an average of the first and second parameters.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREG BENGZON whose telephone number is

(571)272-3944. The examiner can normally be reached on Mon. thru Fri. 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Vaughn can be reached on (571)272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. B./
Examiner, Art Unit 2444

/William C. Vaughn, Jr./

Supervisory Patent Examiner, Art Unit 2444